



#4

# Sequence Listing

<110> Nikolics,  
McFarland, Keith C.  
Segalo, Deborah L.  
Seeburg, Peter H.

<120> Glycoprotein Hormone Receptor Molecules

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<140> US 09/877,804

<141> 2001-06-07

<150> US 08/207,814

<151> 1994-03-07

<150> US 07/781,153

<151> 1991-10-31

<150> US 07/347,683

<151> 1989-05-05

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Ala Val Leu Leu Leu Lys Pro Ser Gln Leu Gln Ser Arg  
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Glu Leu Ser Gly Ser Arg Cys Pro Glu Pro Cys Asp Cys  
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Ala Pro Asp Gly Ala Leu Arg Cys Pro Gly Pro Arg Ala  
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ggc ctc gcc aga cta tct ctc acc tat ctc cct gtc aaa 241  
Gly Leu Ala Arg Leu Ser Leu Thr Tyr Leu Pro Val Lys  
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Val Ile Pro Ser Gln Ala Phe Arg Gly Leu Asn Glu Val  
70 75

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 Val Lys Ile Glu Ile Ser Gln Ser Asp Ser Leu Glu Arg  
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 Glu Asn Glu Leu Ser Gly Trp Asp Tyr Asp Tyr Gly Phe  
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 Arg Tyr Lys Leu Thr Val Pro Arg Phe Leu Met Cys Asn  
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 Ser Gln Ala Thr Leu Lys Leu Ser Thr Val His Cys Gln  
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cag ccc ata cca ccg aga gcg tta act cac tagcatt 2150  
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Gly	Ser	Arg	Cys	Pro	Glu	Pro	Cys	Asp	Cys	Ala	Pro	Asp	Gly	Ala	35	40	45	
Leu	Arg	Cys	Pro	Gly	Pro	Arg	Ala	Gly	Leu	Ala	Arg	Leu	Ser	Leu	50	55	60	
Thr	Tyr	Leu	Pro	Val	Lys	Val	Ile	Pro	Ser	Gln	Ala	Phe	Arg	Gly	65	70	75	
Leu	Asn	Glu	Val	Val	Lys	Ile	Glu	Ile	Ser	Gln	Ser	Asp	Ser	Leu	80	85	90	
Glu	Arg	Ile	Glu	Ala	Asn	Ala	Phe	Asp	Asn	Leu	Leu	Asn	Leu	Ser	95	100	105	
Glu	Leu	Leu	Ile	Gln	Asn	Thr	Lys	Asn	Leu	Leu	Tyr	Ile	Glu	Pro	110	115	120	
Gly	Ala	Phe	Thr	Asn	Leu	Pro	Arg	Leu	Lys	Tyr	Leu	Ser	Ile	Cys	125	130	135	
Asn	Thr	Gly	Ile	Arg	Thr	Leu	Pro	Asp	Val	Thr	Lys	Ile	Ser	Ser	140	145	150	
Ser	Glu	Phe	Asn	Phe	Ile	Leu	Glu	Ile	Cys	Asp	Asn	Leu	His	Ile	155	160	165	
Thr	Thr	Ile	Pro	Gly	Asn	Ala	Phe	Gln	Gly	Met	Asn	Asn	Glu	Ser	170	175	180	
Val	Thr	Leu	Lys	Leu	Tyr	Gly	Asn	Gly	Phe	Glu	Glu	Val	Gln	Ser	185	190	195	
His	Ala	Phe	Asn	Gly	Thr	Thr	Leu	Ile	Ser	Leu	Glu	Leu	Lys	Glu	200	205	210	
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Thr	Gly	Pro	Ser	Ile	Leu	Asp	Ile	Ser	Ser	Thr	Lys	Leu	Gln	Ala	230	235	240	
Leu	Pro	Ser	His	Gly	Leu	Glu	Ser	Ile	Gln	Thr	Leu	Ile	Ala	Leu	245	250	255	

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Ser Leu Leu Val	Ala Thr Leu Thr Tyr	Pro Ser His Cys Cys Ala
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Asp Asn Glu Thr	Leu Tyr Ser Ala Ile	Phe Glu Glu Asn Glu Leu
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Gln Cys Ala Pro	Glu Pro Asp Ala Phe	Asn Pro Cys Glu Asp Ile
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Met Gly Tyr Ala	Phe Leu Arg Val Leu	Ile Trp Leu Ile Asn Ile
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Leu Ala Ile Phe	Gly Asn Leu Thr Val	Leu Phe Val Leu Leu Thr
	380	385 390
Ser Arg Tyr Lys	Leu Thr Val Pro Arg	Phe Leu Met Cys Asn Leu
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Ser Phe Ala Asp	Phe Cys Met Gly Leu	Tyr Leu Leu Leu Ile Ala
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Ser Val Asp Ser	Gln Thr Lys Gly Gln	Tyr Tyr Asn His Ala Ile
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Asp Trp Gln Thr	Gly Ser Gly Cys Gly	Ala Ala Gly Phe Phe Thr
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Val Phe Ala Ser	Glu Leu Ser Val Tyr	Thr Leu Thr Val Ile Thr
	455	460 465
Leu Glu Arg Trp	His Thr Ile Thr Tyr	Ala Val Gln Leu Asp Gln
	470	475 480
Lys Leu Arg Leu	Arg His Ala Ile Pro	Ile Met Leu Gly Gly Trp
	485	490 495
Leu Phe Ser Thr	Leu Ile Ala Thr Met	Pro Leu Val Gly Ile Ser
	500	505 510
Asn Tyr Met Lys	Val Ser Ile Cys Leu	Pro Met Asp Val Glu Ser
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Thr Leu Ser Gln	Val Tyr Ile Leu Ser	Ile Leu Ile Leu Asn Val
	530	535 540

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Ala	Val	Gln	Asn	Pro	Glu	Leu	Thr	Ala	Pro	Asn	Lys	Asp	Thr	Lys
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Ile	Ala	Lys	Lys	Met	Ala	Ile	Leu	Ile	Phe	Thr	Asp	Phe	Thr	Cys
				575					580					585
Met	Ala	Pro	Ile	Ser	Phe	Phe	Ala	Ile	Ser	Ala	Ala	Phe	Lys	Val
				590					595					600
Pro	Leu	Ile	Thr	Val	Thr	Asn	Ser	Lys	Ile	Leu	Leu	Val	Leu	Phe
				605					610					615
Tyr	Pro	Val	Asn	Ser	Cys	Ala	Asn	Pro	Phe	Leu	Tyr	Ala	Ile	Phe
				620					625					630
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Gly	Cys	Cys	Lys	Arg	Arg	Ala	Glu	Leu	Tyr	Arg	Arg	Lys	Glu	Phe
				650					655					660
Ser	Ala	Tyr	Thr	Ser	Asn	Cys	Lys	Asn	Gly	Phe	Pro	Gly	Ala	Ser
				665					670					675
Lys	Pro	Ser	Gln	Ala	Thr	Leu	Lys	Leu	Ser	Thr	Val	His	Cys	Gln
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Gln	Pro	Ile	Pro	Pro	Arg	Ala	Leu	Thr	His					
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Arg	Leu	Ser	Leu	Thr	Tyr	Leu	Pro	Val	Lys	Val	Ile	Pro	Ser	Gln
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Ala	Phe	Arg	Gly	Leu	Asn	Glu	Val	Val	Lys	Ile	Glu	Ile	Ser	Gln
				50					55					60
Ser	Asp	Ser	Leu	Glu	Arg	Ile	Glu	Ala	Asn	Ala	Phe	Asp	Asn	Leu
				65					70					75



Leu	Asn	Leu	Ser	Glu	Leu	Leu	Ile	Gln	Asn	Thr	Lys	Asn	Leu	Leu		80	85	90
Tyr	Ile	Glu	Pro	Gly	Ala	Phe	Thr	Asn	Leu	Pro	Arg	Leu	Lys	Tyr		95	100	105
Leu	Ser	Ile	Cys	Asn	Thr	Gly	Ile	Arg	Thr	Leu	Pro	Asp	Val	Thr		110	115	120
Lys	Ile	Ser	Ser	Ser	Glu	Phe	Asn	Phe	Ile	Leu	Glu	Ile	Cys	Asp		125	130	135
Asn	Leu	His	Ile	Thr	Thr	Ile	Pro	Gly	Asn	Ala	Phe	Gln	Gly	Met		140	145	150
Asn	Asn	Glu	Ser	Val	Thr	Leu	Lys	Leu	Tyr	Gly	Asn	Gly	Phe	Glu		155	160	165
Glu	Val	Gln	Ser	His	Ala	Phe	Asn	Gly	Thr	Thr	Leu	Ile	Ser	Leu		170	175	180
Glu	Leu	Lys	Glu	Asn	Ile	Tyr	Leu	Glu	Lys	Met	His	Ser	Gly	Ala		185	190	195
Phe	Gln	Gly	Ala	Thr	Gly	Pro	Ser	Ile	Leu	Asp	Ile	Ser	Ser	Thr		200	205	210
Lys	Leu	Gln	Ala	Leu	Pro	Ser	His	Gly	Leu	Glu	Ser	Ile	Gln	Thr		215	220	225
Leu	Ile	Ala	Leu	Ser	Ser	Tyr	Ser	Leu	Lys	Thr	Leu	Pro	Ser	Lys		230	235	240
Glu	Lys	Phe	Thr	Ser	Leu	Leu	Val	Ala	Thr	Leu	Thr	Tyr	Pro	Ser		245	250	255
His	Cys	Cys	Ala	Phe	Arg	Asn	Leu	Pro	Lys	Lys	Glu	Gln	Asn	Phe		260	265	270
Ser	Phe	Ser	Ile	Phe	Glu	Asn	Phe	Ser	Lys	Gln	Cys	Glu	Ser	Thr		275	280	285
Val	Arg	Lys	Ala	Asp	Asn	Glu	Thr	Leu	Tyr	Ser	Ala	Ile	Phe	Glu		290	295	300
Glu	Asn	Glu	Leu	Ser	Gly	Trp	Asp	Tyr	Asp	Tyr	Gly	Phe	Cys	Ser		305	310	315
Pro	Lys	Thr	Leu	Gln	Cys	Ala	Pro	Glu	Pro	Asp	Ala	Phe	Asn	Pro		320	325	330
Cys	Glu	Asp	Ile	Met	Gly	Tyr	Ala	Phe	Leu	Arg	Val	Leu	Ile	Trp		335	340	345
Leu	Ile	Asn	Ile	Leu	Ala	Ile	Phe	Gly	Asn	Leu	Thr	Val	Leu	Phe		350	355	360

Val	Leu	Leu	Thr	Ser	Arg	Tyr	Lys	Leu	Thr	Val	Pro	Arg	Phe	Leu	365	370	375
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Leu	Leu	Ile	Ala	Ser	Val	Asp	Ser	Gln	Thr	Lys	Gly	Gln	Tyr	Tyr	395	400	405
Asn	His	Ala	Ile	Asp	Trp	Gln	Thr	Gly	Ser	Gly	Cys	Gly	Ala	Ala	410	415	420
Gly	Phe	Phe	Thr	Val	Phe	Ala	Ser	Glu	Leu	Ser	Val	Tyr	Thr	Leu	425	430	435
Thr	Val	Ile	Thr	Leu	Glu	Arg	Trp	His	Thr	Ile	Thr	Tyr	Ala	Val	440	445	450
Gln	Leu	Asp	Gln	Lys	Leu	Arg	Leu	Arg	His	Ala	Ile	Pro	Ile	Met	455	460	465
Leu	Gly	Gly	Trp	Leu	Phe	Ser	Thr	Leu	Ile	Ala	Thr	Met	Pro	Leu	470	475	480
Val	Gly	Ile	Ser	Asn	Tyr	Met	Lys	Val	Ser	Ile	Cys	Leu	Pro	Met	485	490	495
Asp	Val	Glu	Ser	Thr	Leu	Ser	Gln	Val	Tyr	Ile	Leu	Ser	Ile	Leu	500	505	510
Ile	Leu	Asn	Val	Val	Ala	Phe	Val	Val	Ile	Cys	Ala	Cys	Tyr	Ile	515	520	525
Arg	Ile	Tyr	Phe	Ala	Val	Gln	Asn	Pro	Glu	Leu	Thr	Ala	Pro	Asn	530	535	540
Lys	Asp	Thr	Lys	Ile	Ala	Lys	Lys	Met	Ala	Ile	Leu	Ile	Phe	Thr	545	550	555
Asp	Phe	Thr	Cys	Met	Ala	Pro	Ile	Ser	Phe	Phe	Ala	Ile	Ser	Ala	560	565	570
Ala	Phe	Lys	Val	Pro	Leu	Ile	Thr	Val	Thr	Asn	Ser	Lys	Ile	Leu	575	580	585
Leu	Val	Leu	Phe	Tyr	Pro	Val	Asn	Ser	Cys	Ala	Asn	Pro	Phe	Leu	590	595	600
Tyr	Ala	Ile	Phe	Thr	Lys	Ala	Phe	Gln	Arg	Asp	Phe	Leu	Leu	Leu	605	610	615
Leu	Ser	Arg	Phe	Gly	Cys	Cys	Lys	Arg	Arg	Ala	Glu	Leu	Tyr	Arg	620	625	630
Arg	Lys	Glu	Phe	Ser	Ala	Tyr	Thr	Ser	Asn	Cys	Lys	Asn	Gly	Phe	635	640	645

Pro	Gly	Ala	Ser	Lys	Pro	Ser	Gln	Ala	Thr	Leu	Lys	Leu	Ser	Thr
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Val	His	Cys	Gln	Gln	Pro	Ile	Pro	Pro	Arg	Ala	Leu	Thr	His
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Arg	Leu	Ser	Leu	Thr	Tyr	Leu	Pro	Val	Lys	Val	Ile	Pro	Ser	Gln
				35					40					45
Ala	Phe	Arg	Gly	Leu	Asn	Glu	Val	Val	Lys	Ile	Glu	Ile	Ser	Gln
				50					55					60
Ser	Asp	Ser	Leu	Glu	Arg	Ile	Glu	Ala	Asn	Ala	Phe	Asp	Asn	Leu
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Leu	Asn	Leu	Ser	Glu	Leu	Leu	Ile	Gln	Asn	Thr	Lys	Asn	Leu	Leu
				80					85					90
Tyr	Ile	Glu	Pro	Gly	Ala	Phe	Thr	Asn	Leu	Pro	Arg	Leu	Lys	Tyr
				95					100					105
Leu	Ser	Ile	Cys	Asn	Thr	Gly	Ile	Arg	Thr	Leu	Pro	Asp	Val	Thr
				110					115					120
Lys	Ile	Ser	Ser	Ser	Glu	Phe	Asn	Phe	Ile	Leu	Glu	Ile	Cys	Asp
				125					130					135
Asn	Leu	His	Ile	Thr	Thr	Ile	Pro	Gly	Asn	Ala	Phe	Gln	Gly	Met
				140					145					150
Asn	Asn	Glu	Ser	Val	Thr	Leu	Lys	Leu	Tyr	Gly	Asn	Gly	Phe	Glu
				155					160					165
Glu	Val	Gln	Ser	His	Ala	Phe	Asn	Gly	Thr	Thr	Leu	Ile	Ser	Leu
				170					175					180
Glu	Leu	Lys	Glu	Asn	Ile	Tyr	Leu	Glu	Lys	Met	His	Ser	Gly	Ala
				185					190					195
Phe	Gln	Gly	Ala	Thr	Gly	Pro	Ser	Ile	Leu	Asp	Ile	Ser	Ser	Thr
				200					205					210

Lys	Leu	Gln	Ala	Leu	Pro	Ser	His	Gly	Leu	Glu	Ser	Ile	Gln	Thr	215	220	225
Leu	Ile	Ala	Leu	Ser	Ser	Tyr	Ser	Leu	Lys	Thr	Leu	Pro	Ser	Lys	230	235	240
Glu	Lys	Phe	Thr	Ser	Leu	Leu	Val	Ala	Thr	Leu	Thr	Tyr	Pro	Ser	245	250	255
His	Cys	Cys	Ala	Phe	Arg	Asn	Leu	Pro	Lys	Lys	Glu	Gln	Asn	Phe	260	265	270
Ser	Phe	Ser	Ile	Phe	Glu	Asn	Phe	Ser	Lys	Gln	Cys	Glu	Ser	Thr	275	280	285
Val	Arg	Lys	Ala	Asp	Asn	Glu	Thr	Leu	Tyr	Ser	Ala	Ile	Phe	Glu	290	295	300
Glu	Asn	Glu	Leu	Ser	Gly	Trp	Asp	Tyr	Asp	Tyr	Gly	Phe	Cys	Ser	305	310	315
Pro	Lys	Thr	Leu	Gln	Cys	Ala	Pro	Glu	Pro	Asp	Ala	Phe	Asn	Pro	320	325	330
Cys	Glu	Asp	Ile	Met	Gly	Tyr	Ala	Phe	Leu	Arg					335	340	

<210> 5  
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 <212> DNA  
 <213> Rattus

<400> 5  
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cggtgaatgg	ataaataagg	atg	gcc	ttg	ctc	ctg	gtc	tcc	91
		Met	Ala	Leu	Leu	Leu	Val	Ser	
		1				5			

ttg	ctg	gca	ttc	ttg	ggc	acg	gga	tct	gga	tgt	cat	cac	130
Leu	Leu	Ala	Phe	Leu	Gly	Thr	Gly	Ser	Gly	Cys	His	His	
		10				15						20	

tgg	ctg	tgt	cat	tgc	tct	aat	agg	gtc	ttt	ctc	tgc	caa	169
Trp	Leu	Cys	His	Cys	Ser	Asn	Arg	Val	Phe	Leu	Cys	Gln	
			25							30			

gac	agc	aag	gtg	aca	gag	att	ccg	acc	gac	ctc	ccc	cgg	208
Asp	Ser	Lys	Val	Thr	Glu	Ile	Pro	Thr	Asp	Leu	Pro	Arg	
	35					40					45		

aac	gcc	att	gaa	ctg	agg	ttt	gtg	ctc	acc	aag	ctt	cga	247
Asn	Ala	Ile	Glu	Leu	Arg	Phe	Val	Leu	Thr	Lys	Leu	Arg	
		50						55					

gtc	atc	ccg	aaa	gga	tca	ttt	gct	gga	ttt	gga	gac	ctg	286
Val	Ile	Pro	Lys	Gly	Ser	Phe	Ala	Gly	Phe	Gly	Asp	Leu	
	60				65						70		

gag aaa ata gag atc tct cag aat gat gtc ttg gaa gta 325  
 Glu Lys Ile Glu Ile Ser Gln Asn Asp Val Leu Glu Val  
 75 80 85

ata gag gca gat gtg ttc tcc aac cta ccc aag ttg cat 364  
 Ile Glu Ala Asp Val Phe Ser Asn Leu Pro Lys Leu His  
 90 95

gaa att agg att gaa aag gcc aac aat ctt ctg tac atc 403  
 Glu Ile Arg Ile Glu Lys Ala Asn Asn Leu Leu Tyr Ile  
 100 105 110

aac ccg gag gcc ttc cag aat ctc ccc agt ctc aga tat 442  
 Asn Pro Glu Ala Phe Gln Asn Leu Pro Ser Leu Arg Tyr  
 115 120

ctg tta ata tcc aac aca ggc att aag cac ttg cca gct 481  
 Leu Leu Ile Ser Asn Thr Gly Ile Lys His Leu Pro Ala  
 125 130 135

gtt cac aag atc cag tct ctc caa aag gtt cta cta gac 520  
 Val His Lys Ile Gln Ser Leu Gln Lys Val Leu Leu Asp  
 140 145 150

att caa gat aac ata aac atc cac atc gtt gcc agg aac 559  
 Ile Gln Asp Asn Ile Asn Ile His Ile Val Ala Arg Asn  
 155 160

tcc ttc atg gga ctg agt ttt gaa agt gtg att tta tgg 598  
 Ser Phe Met Gly Leu Ser Phe Glu Ser Val Ile Leu Trp  
 165 170 175

ctg agt aag aat ggg att gaa gaa ata cac aac tgt gca 637  
 Leu Ser Lys Asn Gly Ile Glu Glu Ile His Asn Cys Ala  
 180 185

ttc aac gga act cag cta gat gaa ctg aat cta agc gat 676  
 Phe Asn Gly Thr Gln Leu Asp Glu Leu Asn Leu Ser Asp  
 190 195 200

aac aat aat ttg gaa gaa ttg cct aat gac gtt ttc cag 715  
 Asn Asn Asn Leu Glu Glu Leu Pro Asn Asp Val Phe Gln  
 205 210 215

gga gcc tct ggg cca gtc att tta gat atc tca agg aca 754  
 Gly Ala Ser Gly Pro Val Ile Leu Asp Ile Ser Arg Thr  
 220 225

aag gtc cat tcc tta cca aac cat ggc tta gaa aat ctg 793  
 Lys Val His Ser Leu Pro Asn His Gly Leu Glu Asn Leu  
 230 235 240

aag aag ctg agg gcc agg tca aca tac cgc ttg aaa aag 832  
 Lys Lys Leu Arg Ala Arg Ser Thr Tyr Arg Leu Lys Lys  
 245 250

ctc cct aat ctg gac aag ttt gtc acc ctc atg gag gcc 871  
 Leu Pro Asn Leu Asp Lys Phe Val Thr Leu Met Glu Ala  
 255 260 265

agc ctc acc tac ccc agc cac tgc tgt gct ttt gca aac 910  
 Ser Leu Thr Tyr Pro Ser His Cys Cys Ala Phe Ala Asn  
 270 275 280

ttg aag cgg caa atc tct gaa ctt cat cca att tgc aac 949  
 Leu Lys Arg Gln Ile Ser Glu Leu His Pro Ile Cys Asn  
 285 290

aag tct att tta agg caa gat att gat gat atg act caa 988  
 Lys Ser Ile Leu Arg Gln Asp Ile Asp Asp Met Thr Gln  
 295 300 305

att ggg gat cag aga gtc tct ctg ata gat gat gaa ccc 1027  
 Ile Gly Asp Gln Arg Val Ser Leu Ile Asp Asp Glu Pro  
 310 315

agt tat gga aaa gga tct gac atg atg tac aat gaa ttt 1066  
 Ser Tyr Gly Lys Gly Ser Asp Met Met Tyr Asn Glu Phe  
 320 325 330

gat tat gac tta tgt aat gaa gtt gtt gat gtg acc tgc 1105  
 Asp Tyr Asp Leu Cys Asn Glu Val Val Asp Val Thr Cys  
 335 340 345

tca cca aag cca gat gca ttt aat cca tgt gaa gat atc 1144  
 Ser Pro Lys Pro Asp Ala Phe Asn Pro Cys Glu Asp Ile  
 350 355

atg ggg tac aac atc ctc agg gtc ttg ata tgg ttt att 1183  
 Met Gly Tyr Asn Ile Leu Arg Val Leu Ile Trp Phe Ile  
 360 365 370

agc atc ctg gcc att act ggg aac acc aca gtg ctg gtg 1222  
 Ser Ile Leu Ala Ile Thr Gly Asn Thr Thr Val Leu Val  
 375 380

gtc ctg acc aca agc caa tac aaa cta act gtg ccc cgg 1261  
 Val Leu Thr Thr Ser Gln Tyr Lys Leu Thr Val Pro Arg  
 385 390 395

ttt ctt atg tgt aac ctc gcc ttc gct gat ctc tgc ata 1300  
 Phe Leu Met Cys Asn Leu Ala Phe Ala Asp Leu Cys Ile  
 400 405 410

ggc atc tac ttg cta ctt ata gca tca gtt gac atc cat 1339  
 Gly Ile Tyr Leu Leu Leu Ile Ala Ser Val Asp Ile His  
 415 420

acc aag agc cag tac cac aac tat gcc att gac tgg caa 1378  
 Thr Lys Ser Gln Tyr His Asn Tyr Ala Ile Asp Trp Gln  
 425 430 435

aca gga gca ggc tgt gat gct gct ggc ttt ttc act gtc 1417  
 Thr Gly Ala Gly Cys Asp Ala Ala Gly Phe Phe Thr Val  
 440 445

ttt gcc agt gaa ctg tca gtc tac aca ttg aca gcc atc 1456  
 Phe Ala Ser Glu Leu Ser Val Tyr Thr Leu Thr Ala Ile  
 450 455 460

acc cta gaa aga tgg cat acc atc aca cat gct atg caa 1495  
 Thr Leu Glu Arg Trp His Thr Ile Thr His Ala Met Gln  
 465 470 475

ctg gaa tgc aag gtg cag ctc cgg cat gct gcc agc gtc 1534  
 Leu Glu Cys Lys Val Gln Leu Arg His Ala Ala Ser Val  
 480 485

atg gta ttg ggc tgg act ttt gcc ttc gca gct gct ctc 1573  
 Met Val Leu Gly Trp Thr Phe Ala Phe Ala Ala Ala Leu  
 490 495 500

ttc ccc atc ttt ggc atc agt agc tac atg aaa gtg agc 1612  
 Phe Pro Ile Phe Gly Ile Ser Ser Tyr Met Lys Val Ser  
 505 510

atc tgc ctg ccc atg gat atc gac agc cct ttg tca cag 1651  
 Ile Cys Leu Pro Met Asp Ile Asp Ser Pro Leu Ser Gln  
 515 520 525

ctg tat gtt atg gcc ctc ctt gtc ctc aat gtc ctg gcc 1690  
 Leu Tyr Val Met Ala Leu Leu Val Leu Asn Val Leu Ala  
 530 535 540

ttt gtg gtc atc tgt ggc tgc tat acc cac atc tac ctc 1729  
 Phe Val Val Ile Cys Gly Cys Tyr Thr His Ile Tyr Leu  
 545 550

aca gtg agg aat cct acc att gtg tcc tca tca agc gac 1768  
 Thr Val Arg Asn Pro Thr Ile Val Ser Ser Ser Ser Asp  
 555 560 565

acc aag att gcc aag cgc atg gcc aca ctc atc ttc aca 1807  
 Thr Lys Ile Ala Lys Arg Met Ala Thr Leu Ile Phe Thr  
 570 575

gac ttt ctc tgc atg gcc ccc att tca ttc ttt gcc att 1846  
 Asp Phe Leu Cys Met Ala Pro Ile Ser Phe Phe Ala Ile  
 580 585 590

tct gcc tcc ctc aag gtg ccg ctc atc act gtg tcc aag 1885  
 Ser Ala Ser Leu Lys Val Pro Leu Ile Thr Val Ser Lys  
 595 600 605

gcc aag att ctc cta gtt ctg ttc tac ccc atc aat tct 1924  
 Ala Lys Ile Leu Leu Val Leu Phe Tyr Pro Ile Asn Ser  
 610 615

tgt gcc aat cct ttc ctc tac gcc att ttc acc aag aac 1963  
 Cys Ala Asn Pro Phe Leu Tyr Ala Ile Phe Thr Lys Asn  
       620                      625                      630

ttc cgc agg gac ttc ttc atc ctg ctg agc aag ttt ggc 2002  
 Phe Arg Arg Asp Phe Phe Ile Leu Leu Ser Lys Phe Gly  
               635                      640

tgt tat gaa atg caa gcc cag att tac agg aca gaa acc 2041  
 Cys Tyr Glu Met Gln Ala Gln Ile Tyr Arg Thr Glu Thr  
 645                      650                      655

tca tcc gct acc cac aac ttc cat gcc cga aag agc cac 2080  
 Ser Ser Ala Thr His Asn Phe His Ala Arg Lys Ser His  
       660                      665                      670

tgc tcc tca gct ccc aga gtc acc aat agt tac gtg ctt 2119  
 Cys Ser Ser Ala Pro Arg Val Thr Asn Ser Tyr Val Leu  
               675                      680

gtc cct ctt aat cat tca tcc cag aac taaa aatcaatgtg 2160  
 Val Pro Leu Asn His Ser Ser Gln Asn  
       685                      690              692

aaaatggatc ctcaccttga aagacaatta tgactccttc tgaagagcag 2210

gccatggact aaatggcaat cctactgcac atctcatcta atttaatctc 2260

tctgggtctc tgcattggcag actgatcagg gaccattaat cacccttttg 2310

gctcctctca cacttaaata atggtaacag caaataaaac aaagcaaaac 2360

cgcaca 2366

<210> 6

<211> 692

<212> PRT

<213> Artificial sequence

<220>

<223> deduced sequence

<400> 6

Met Ala Leu Leu Leu Val Ser Leu Leu Ala Phe Leu Gly Thr Gly  
       1                      5                      10                      15

Ser Gly Cys His His Trp Leu Cys His Cys Ser Asn Arg Val Phe  
                       20                      25                      30

Leu Cys Gln Asp Ser Lys Val Thr Glu Ile Pro Thr Asp Leu Pro  
                       35                      40                      45

Arg Asn Ala Ile Glu Leu Arg Phe Val Leu Thr Lys Leu Arg Val  
                       50                      55                      60

Ile Pro Lys Gly Ser Phe Ala Gly Phe Gly Asp Leu Glu Lys Ile  
                       65                      70                      75



Glu	Ile	Ser	Gln	Asn	Asp	Val	Leu	Glu	Val	Ile	Glu	Ala	Asp	Val	80	85	90
Phe	Ser	Asn	Leu	Pro	Lys	Leu	His	Glu	Ile	Arg	Ile	Glu	Lys	Ala	95	100	105
Asn	Asn	Leu	Leu	Tyr	Ile	Asn	Pro	Glu	Ala	Phe	Gln	Asn	Leu	Pro	110	115	120
Ser	Leu	Arg	Tyr	Leu	Leu	Ile	Ser	Asn	Thr	Gly	Ile	Lys	His	Leu	125	130	135
Pro	Ala	Val	His	Lys	Ile	Gln	Ser	Leu	Gln	Lys	Val	Leu	Leu	Asp	140	145	150
Ile	Gln	Asp	Asn	Ile	Asn	Ile	His	Ile	Val	Ala	Arg	Asn	Ser	Phe	155	160	165
Met	Gly	Leu	Ser	Phe	Glu	Ser	Val	Ile	Leu	Trp	Leu	Ser	Lys	Asn	170	175	180
Gly	Ile	Glu	Glu	Ile	His	Asn	Cys	Ala	Phe	Asn	Gly	Thr	Gln	Leu	185	190	195
Asp	Glu	Leu	Asn	Leu	Ser	Asp	Asn	Asn	Asn	Leu	Glu	Glu	Leu	Pro	200	205	210
Asn	Asp	Val	Phe	Gln	Gly	Ala	Ser	Gly	Pro	Val	Ile	Leu	Asp	Ile	215	220	225
Ser	Arg	Thr	Lys	Val	His	Ser	Leu	Pro	Asn	His	Gly	Leu	Glu	Asn	230	235	240
Leu	Lys	Lys	Leu	Arg	Ala	Arg	Ser	Thr	Tyr	Arg	Leu	Lys	Lys	Leu	245	250	255
Pro	Asn	Leu	Asp	Lys	Phe	Val	Thr	Leu	Met	Glu	Ala	Ser	Leu	Thr	260	265	270
Tyr	Pro	Ser	His	Cys	Cys	Ala	Phe	Ala	Asn	Leu	Lys	Arg	Gln	Ile	275	280	285
Ser	Glu	Leu	His	Pro	Ile	Cys	Asn	Lys	Ser	Ile	Leu	Arg	Gln	Asp	290	295	300
Ile	Asp	Asp	Met	Thr	Gln	Ile	Gly	Asp	Gln	Arg	Val	Ser	Leu	Ile	305	310	315
Asp	Asp	Glu	Pro	Ser	Tyr	Gly	Lys	Gly	Ser	Asp	Met	Met	Tyr	Asn	320	325	330
Glu	Phe	Asp	Tyr	Asp	Leu	Cys	Asn	Glu	Val	Val	Asp	Val	Thr	Cys	335	340	345
Ser	Pro	Lys	Pro	Asp	Ala	Phe	Asn	Pro	Cys	Glu	Asp	Ile	Met	Gly	350	355	360

Tyr Asn Ile Leu Arg	Val Leu Ile Trp	Phe Ile Ser Ile Leu Ala	365	370	375
Ile Thr Gly Asn Thr	Thr Val Leu Val	Val Leu Thr Thr Ser Gln	380	385	390
Tyr Lys Leu Thr Val	Pro Arg Phe Leu	Met Cys Asn Leu Ala Phe	395	400	405
Ala Asp Leu Cys Ile	Gly Ile Tyr Leu	Leu Leu Ile Ala Ser Val	410	415	420
Asp Ile His Thr Lys	Ser Gln Tyr His	Asn Tyr Ala Ile Asp Trp	425	430	435
Gln Thr Gly Ala Gly	Cys Asp Ala Ala	Gly Phe Phe Thr Val Phe	440	445	450
Ala Ser Glu Leu Ser	Val Tyr Thr Leu	Thr Ala Ile Thr Leu Glu	455	460	465
Arg Trp His Thr Ile	Thr His Ala Met	Gln Leu Glu Cys Lys Val	470	475	480
Gln Leu Arg His Ala	Ala Ser Val Met	Val Leu Gly Trp Thr Phe	485	490	495
Ala Phe Ala Ala Ala	Leu Phe Pro Ile	Phe Gly Ile Ser Ser Tyr	500	505	510
Met Lys Val Ser Ile	Cys Leu Pro Met	Asp Ile Asp Ser Pro Leu	515	520	525
Ser Gln Leu Tyr Val	Met Ala Leu Leu	Val Leu Asn Val Leu Ala	530	535	540
Phe Val Val Ile Cys	Gly Cys Tyr Thr	His Ile Tyr Leu Thr Val	545	550	555
Arg Asn Pro Thr Ile	Val Ser Ser Ser	Ser Asp Thr Lys Ile Ala	560	565	570
Lys Arg Met Ala Thr	Leu Ile Phe Thr	Asp Phe Leu Cys Met Ala	575	580	585
Pro Ile Ser Phe Phe	Ala Ile Ser Ala	Ser Leu Lys Val Pro Leu	590	595	600
Ile Thr Val Ser Lys	Ala Lys Ile Leu	Leu Val Leu Phe Tyr Pro	605	610	615
Ile Asn Ser Cys Ala	Asn Pro Phe Leu	Tyr Ala Ile Phe Thr Lys	620	625	630
Asn Phe Arg Arg Asp	Phe Phe Ile Leu	Leu Ser Lys Phe Gly Cys	635	640	645

Tyr Glu Met Gln Ala Gln Ile Tyr Arg Thr Glu Thr Ser Ser Ala  
650 655 660

Thr His Asn Phe His Ala Arg Lys Ser His Cys Ser Ser Ala Pro  
665 670 675

Arg Val Thr Asn Ser Tyr Val Leu Val Pro Leu Asn His Ser Ser  
680 685 690

Gln Asn

<210> 7

<211> 675

<212> PRT

<213> Artificial sequence

<220>

<223> deduced sequence

<400> 7

Cys His His Trp Leu Cys His Cys Ser Asn Arg Val Phe Leu Cys  
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Gln Asp Ser Lys Val Thr Glu Ile Pro Thr Asp Leu Pro Arg Asn  
20 25 30

Ala Ile Glu Leu Arg Phe Val Leu Thr Lys Leu Arg Val Ile Pro  
35 40 45

Lys Gly Ser Phe Ala Gly Phe Gly Asp Leu Glu Lys Ile Glu Ile  
50 55 60

Ser Gln Asn Asp Val Leu Glu Val Ile Glu Ala Asp Val Phe Ser  
65 70 75

Asn Leu Pro Lys Leu His Glu Ile Arg Ile Glu Lys Ala Asn Asn  
80 85 90

Leu Leu Tyr Ile Asn Pro Glu Ala Phe Gln Asn Leu Pro Ser Leu  
95 100 105

Arg Tyr Leu Leu Ile Ser Asn Thr Gly Ile Lys His Leu Pro Ala  
110 115 120

Val His Lys Ile Gln Ser Leu Gln Lys Val Leu Leu Asp Ile Gln  
125 130 135

Asp Asn Ile Asn Ile His Ile Val Ala Arg Asn Ser Phe Met Gly  
140 145 150

Leu Ser Phe Glu Ser Val Ile Leu Trp Leu Ser Lys Asn Gly Ile  
155 160 165

Glu Glu Ile His Asn Cys Ala Phe Asn Gly Thr Gln Leu Asp Glu  
170 175 180

Leu Asn Leu Ser	Asp 185	Asn Asn Asn Leu	Glu 190	Glu Leu Pro Asn	Asp 195
Val Phe Gln Gly	Ala 200	Ser Gly Pro Val	Ile 205	Leu Asp Ile Ser	Arg 210
Thr Lys Val His	Ser 215	Leu Pro Asn His	Gly 220	Leu Glu Asn Leu	Lys 225
Lys Leu Arg Ala	Arg 230	Ser Thr Tyr Arg	Leu 235	Lys Lys Leu Pro	Asn 240
Leu Asp Lys Phe	Val 245	Thr Leu Met Glu	Ala 250	Ser Leu Thr Tyr	Pro 255
Ser His Cys Cys	Ala 260	Phe Ala Asn Leu	Lys 265	Arg Gln Ile Ser	Glu 270
Leu His Pro Ile	Cys 275	Asn Lys Ser Ile	Leu 280	Arg Gln Asp Ile	Asp 285
Asp Met Thr Gln	Ile 290	Gly Asp Gln Arg	Val 295	Ser Leu Ile Asp	Asp 300
Glu Pro Ser Tyr	Gly 305	Lys Gly Ser Asp	Met 310	Met Tyr Asn Glu	Phe 315
Asp Tyr Asp Leu	Cys 320	Asn Glu Val Val	Asp 325	Val Thr Cys Ser	Pro 330
Lys Pro Asp Ala	Phe 335	Asn Pro Cys Glu	Asp 340	Ile Met Gly Tyr	Asn 345
Ile Leu Arg Val	Leu 350	Ile Trp Phe Ile	Ser 355	Ile Leu Ala Ile	Thr 360
Gly Asn Thr Thr	Val 365	Leu Val Val Leu	Thr 370	Thr Ser Gln Tyr	Lys 375
Leu Thr Val Pro	Arg 380	Phe Leu Met Cys	Asn 385	Leu Ala Phe Ala	Asp 390
Leu Cys Ile Gly	Ile 395	Tyr Leu Leu Leu	Ile 400	Ala Ser Val Asp	Ile 405
His Thr Lys Ser	Gln 410	Tyr His Asn Tyr	Ala 415	Ile Asp Trp Gln	Thr 420
Gly Ala Gly Cys	Asp 425	Ala Ala Gly Phe	Phe 430	Thr Val Phe Ala	Ser 435
Glu Leu Ser Val	Tyr 440	Thr Leu Thr Ala	Ile 445	Thr Leu Glu Arg	Trp 450
His Thr Ile Thr	His 455	Ala Met Gln Leu	Glu 460	Cys Lys Val Gln	Leu 465

Arg	His	Ala	Ala	Ser	Val	Met	Val	Leu	Gly	Trp	Thr	Phe	Ala	Phe	470	475	480
Ala	Ala	Ala	Leu	Phe	Pro	Ile	Phe	Gly	Ile	Ser	Ser	Tyr	Met	Lys	485	490	495
Val	Ser	Ile	Cys	Leu	Pro	Met	Asp	Ile	Asp	Ser	Pro	Leu	Ser	Gln	500	505	510
Leu	Tyr	Val	Met	Ala	Leu	Leu	Val	Leu	Asn	Val	Leu	Ala	Phe	Val	515	520	525
Val	Ile	Cys	Gly	Cys	Tyr	Thr	His	Ile	Tyr	Leu	Thr	Val	Arg	Asn	530	535	540
Pro	Thr	Ile	Val	Ser	Ser	Ser	Ser	Asp	Thr	Lys	Ile	Ala	Lys	Arg	545	550	555
Met	Ala	Thr	Leu	Ile	Phe	Thr	Asp	Phe	Leu	Cys	Met	Ala	Pro	Ile	560	565	570
Ser	Phe	Phe	Ala	Ile	Ser	Ala	Ser	Leu	Lys	Val	Pro	Leu	Ile	Thr	575	580	585
Val	Ser	Lys	Ala	Lys	Ile	Leu	Leu	Val	Leu	Phe	Tyr	Pro	Ile	Asn	590	595	600
Ser	Cys	Ala	Asn	Pro	Phe	Leu	Tyr	Ala	Ile	Phe	Thr	Lys	Asn	Phe	605	610	615
Arg	Arg	Asp	Phe	Phe	Ile	Leu	Leu	Ser	Lys	Phe	Gly	Cys	Tyr	Glu	620	625	630
Met	Gln	Ala	Gln	Ile	Tyr	Arg	Thr	Glu	Thr	Ser	Ser	Ala	Thr	His	635	640	645
Asn	Phe	His	Ala	Arg	Lys	Ser	His	Cys	Ser	Ser	Ala	Pro	Arg	Val	650	655	660
Thr	Asn	Ser	Tyr	Val	Leu	Val	Pro	Leu	Asn	His	Ser	Ser	Gln	Asn	665	670	675

<210> 8

<211> 348

<212> PRT

<213> Artificial sequence

<220>

<223> deduced sequence

<400> 8

Cys	His	His	Trp	Leu	Cys	His	Cys	Ser	Asn	Arg	Val	Phe	Leu	Cys	1	5	10	15
Gln	Asp	Ser	Lys	Val	Thr	Glu	Ile	Pro	Thr	Asp	Leu	Pro	Arg	Asn	20	25	30	

Ala	Ile	Glu	Leu	Arg	Phe	Val	Leu	Thr	Lys	Leu	Arg	Val	Ile	Pro	35	40	45
Lys	Gly	Ser	Phe	Ala	Gly	Phe	Gly	Asp	Leu	Glu	Lys	Ile	Glu	Ile	50	55	60
Ser	Gln	Asn	Asp	Val	Leu	Glu	Val	Ile	Glu	Ala	Asp	Val	Phe	Ser	65	70	75
Asn	Leu	Pro	Lys	Leu	His	Glu	Ile	Arg	Ile	Glu	Lys	Ala	Asn	Asn	80	85	90
Leu	Leu	Tyr	Ile	Asn	Pro	Glu	Ala	Phe	Gln	Asn	Leu	Pro	Ser	Leu	95	100	105
Arg	Tyr	Leu	Leu	Ile	Ser	Asn	Thr	Gly	Ile	Lys	His	Leu	Pro	Ala	110	115	120
Val	His	Lys	Ile	Gln	Ser	Leu	Gln	Lys	Val	Leu	Leu	Asp	Ile	Gln	125	130	135
Asp	Asn	Ile	Asn	Ile	His	Ile	Val	Ala	Arg	Asn	Ser	Phe	Met	Gly	140	145	150
Leu	Ser	Phe	Glu	Ser	Val	Ile	Leu	Trp	Leu	Ser	Lys	Asn	Gly	Ile	155	160	165
Glu	Glu	Ile	His	Asn	Cys	Ala	Phe	Asn	Gly	Thr	Gln	Leu	Asp	Glu	170	175	180
Leu	Asn	Leu	Ser	Asp	Asn	Asn	Asn	Leu	Glu	Glu	Leu	Pro	Asn	Asp	185	190	195
Val	Phe	Gln	Gly	Ala	Ser	Gly	Pro	Val	Ile	Leu	Asp	Ile	Ser	Arg	200	205	210
Thr	Lys	Val	His	Ser	Leu	Pro	Asn	His	Gly	Leu	Glu	Asn	Leu	Lys	215	220	225
Lys	Leu	Arg	Ala	Arg	Ser	Thr	Tyr	Arg	Leu	Lys	Lys	Leu	Pro	Asn	230	235	240
Leu	Asp	Lys	Phe	Val	Thr	Leu	Met	Glu	Ala	Ser	Leu	Thr	Tyr	Pro	245	250	255
Ser	His	Cys	Cys	Ala	Phe	Ala	Asn	Leu	Lys	Arg	Gln	Ile	Ser	Glu	260	265	270
Leu	His	Pro	Ile	Cys	Asn	Lys	Ser	Ile	Leu	Arg	Gln	Asp	Ile	Asp	275	280	285
Asp	Met	Thr	Gln	Ile	Gly	Asp	Gln	Arg	Val	Ser	Leu	Ile	Asp	Asp	290	295	300
Glu	Pro	Ser	Tyr	Gly	Lys	Gly	Ser	Asp	Met	Met	Tyr	Asn	Glu	Phe	305	310	315

Asp Tyr Asp Leu Cys Asn Glu Val Val Asp Val Thr Cys Ser Pro  
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Lys Pro Asp Ala Phe Asn Pro Cys Glu Asp Ile Met Gly Tyr Asn  
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Ile Leu Arg

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